Vasagatan 5a Göteborg Sweden March 18:th 58

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Professor Joshua Lederberg
The University of Wisconsin, Madison 6

Dear Professor Lederberg,

I thank you for your letter of Febr. 20 .I received it here in Göteborg, when I was laid up with pneumonia, from which I am now recovering, My work in the Pacific ceased end of last Oct, when I returned to Sweden via Rome.

I am much interested in your views and shall do my best to give you the information required. The volume of air passed through my filtra varied between several 100 and a couple of thousands of cubic metres , mostly from 1 600 to 1 500 cu.metres.
The figure given in my letter to Nature of 0,572 mg of cosmic dust per 1 000 m^3 of air passed through the filters is based on the assumption, that the proportion of nickel in the cosmic dust is on an average 2,5 %, according to Watsons estimate.However, to ascribe this average dust-content to the whole air-column from the surface up to the 100 km level is naturally an assumption which may or may not be justified.According to a letter I have received from Prof. Öpik of the Armagh Observatory of N Ireland, this value should be reduced to one third, according to the distribution with height which he ascribes to the cosmic dust in the upper layers

Further assumptions enter into the calculus of the "flux", viz. the rate of descent of the cosmic dust through the atmosphere. Assuming the "Verweilszeit" in the atmpsphere to be 2 years, like that of the Krakatoa dust of 1883-85, the weight of cosmic dust settling through 1 m^2 of horizontal surface should be 28,6 mg/m^2 year. However, taking a rate of descent for the dust 18 times higher, as Bowen does (Verweilszeit only 40 days) the flux is accordingly increased in the same proportion, i.e. to 505,8 mg per m^2 and year.My personal opinion is that the true value of the flux will be much nearer to the former, lower value than to the latter. I hope that the observations now being continued may settle this point.

As I have left the continued sampling in the hands of Prof Walter Steiger Geophysics Dept University of Hawaii, may I suggest that you send your desiderata to him ,quoting this my letter to you.I think he will do his best to meet your requirements.

PETTERSON, H.

Your ideas about the sampling of cosmic dust for microbiological studies are certainly interesting. I am afraid the technique I have been using offers no guarantees against contamination with terrestrial spores For that purpose dust-sampling at still higher altitudes might be advisable, There are two localities suitable for such purpose , one the Observatory on the Jungfraujoch in Switzerland, the other the Andean observatory at Chacaltaya in Bolivia , Director Prof Ismael Escobar, altitu 17 060 feet. I believe airsampling at either, or preferably both, localities might give important results. The prevalence of "aerial plankton " at lower altitudes would involve serious complications from your point of view.

Arrhenius' "pan-spermi" hypothesis was much discussed in my youth . I believe the sterilizing effects of ultraviolet light and of cosmic rays outside our atmosphere is a main argument against the survival of ev. viable spores through interplanetary space, but on this subject I would not at present hazard any opinion.

A reprint from a paper by myself and a collaborator now apparing in Pacific Science will be sent to you as soon as published.

With my best wishes for your your interesting research

I am

yours sincerely

Hans Pettersson